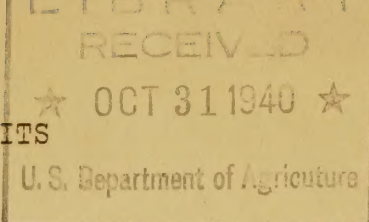


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MANUFACTURE OF ESSENTIAL OILS FROM CITRUS FRUITS

The outer rinds of citrus fruits, known as the "flavedo", contain small amounts of oil and wax. Chemically the oils are quite different from vegetable or seed oils. These are largely composed of glycerides of fatty acids, while citrus peel oils are largely terpenes, closely allied to turpentine. Citrus oils are exclusively used for flavoring or in perfumes.

The fruits yield only small quantities of oil, the actual content being from one to two pounds to a little over twenty pounds per ton of whole fruits. Lemons and oranges contain usually from 8 to 12 pounds. Most mechanical methods of recovery yield 50 per cent or less. Distillation of the ground fruit or of the peel by a current of steam passing through the mass will give high yields of oil. However, the quality of the product is usually so poor that, except in the case of lime oil, it cannot be sold in competition with hand pressed or machine made oils.

Oils made by pressing the rinds into a sponge are believed by many buyers to have the finest quality, which is reflected in the price obtainable for such oils. The method, however, is rapidly being discarded, owing to the expense of operation. It is being replaced in Italy by machines which simulate the action of the hand method.

In one process used in this country, the whole fruit is crushed by specially constructed rolls in such a way as to mix the oil with the juice, from which it is separated by centrifugal devices.

Inasmuch as most of the juice canneries ream out the fruit, the peels constitute a large volume of waste. In some cases these peels are ground under pressure and some of the oil separated in this way. Another method is to feed the peel between corrugated rolls revolving at different speeds, and adjusted to give sufficient pressure to press out some of the oil.

Several patents have been issued involving solvent processes. Such methods usually recover a high percentage of the oil and some of the waxy material. However, considerable difficulty is encountered in adequately separating the solvent from the flavoring material. Even the slight traces of the solvent remaining behind spoil the flavor of the extract.

Most of the devices for producing oils have originated in by-product plants and few of them can be obtained on the open market. It is not possible, therefore, to describe the methods in detail or to refer to manufacturers of apparatus.

Food Research Unit,
Agricultural Chemical Research Division,
Bureau of Agr. Chem. and Eng.,
U. S. Dept. Agriculture,
Washington, D.C.

